

Fig. 1 (a)

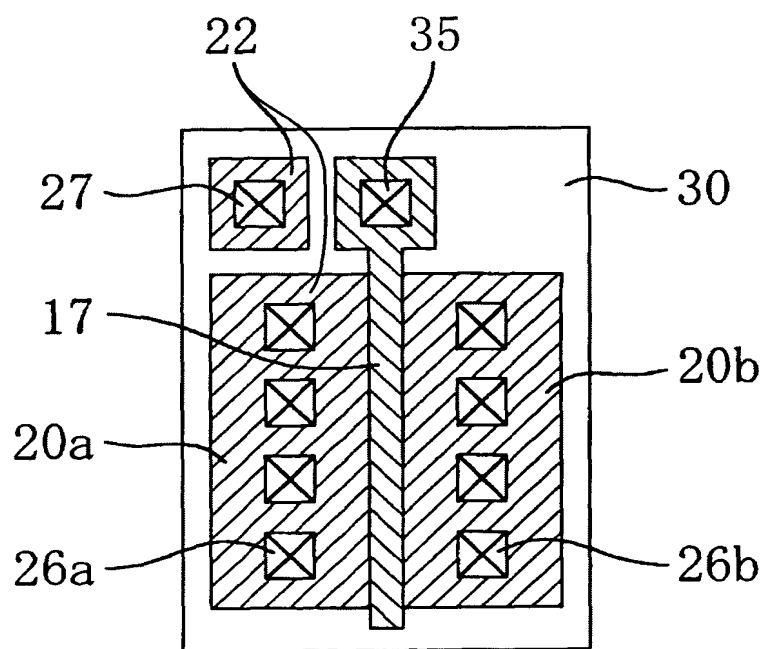


Fig. 1 (b)

Fig. 2(a)

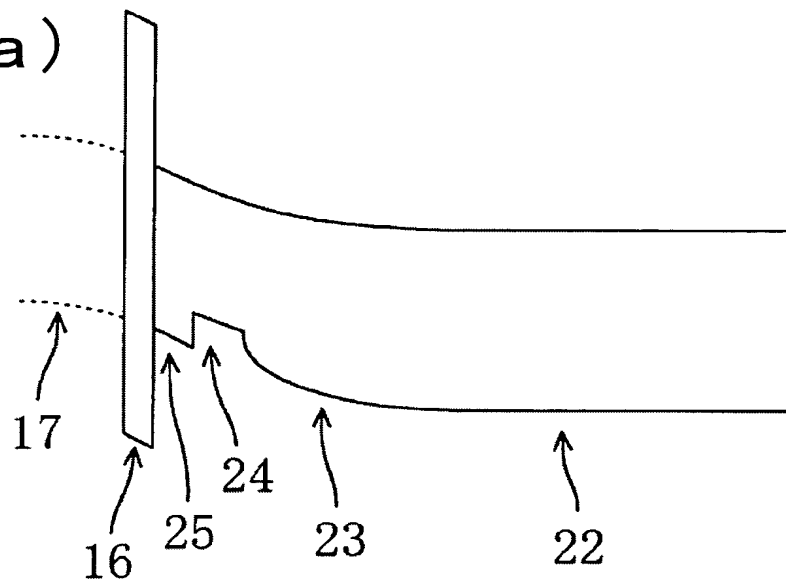


Fig. 2(b)

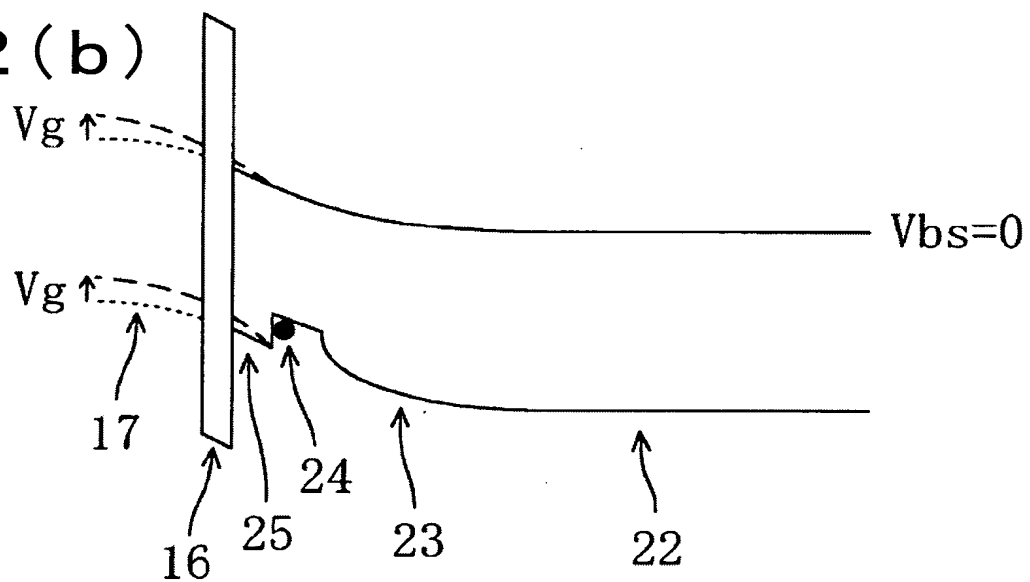
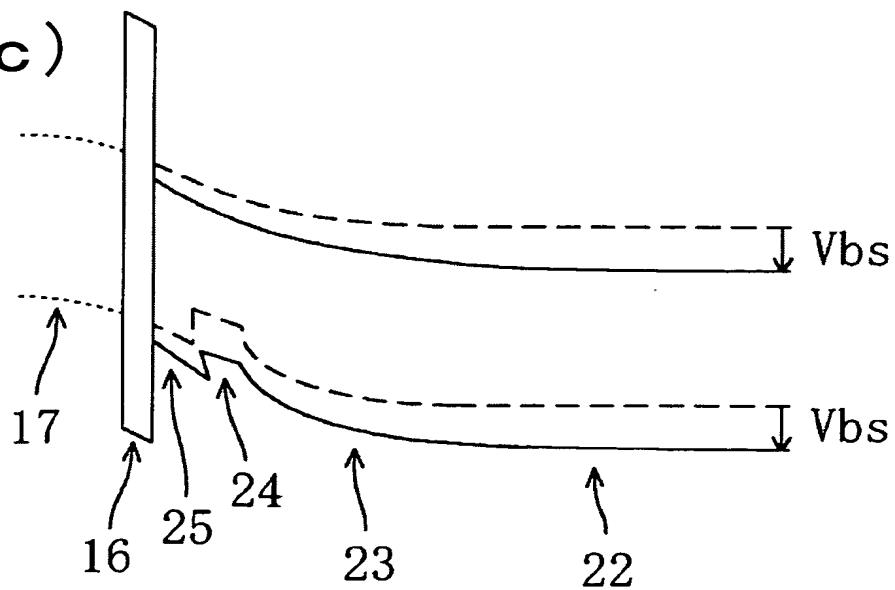


Fig. 2(c)



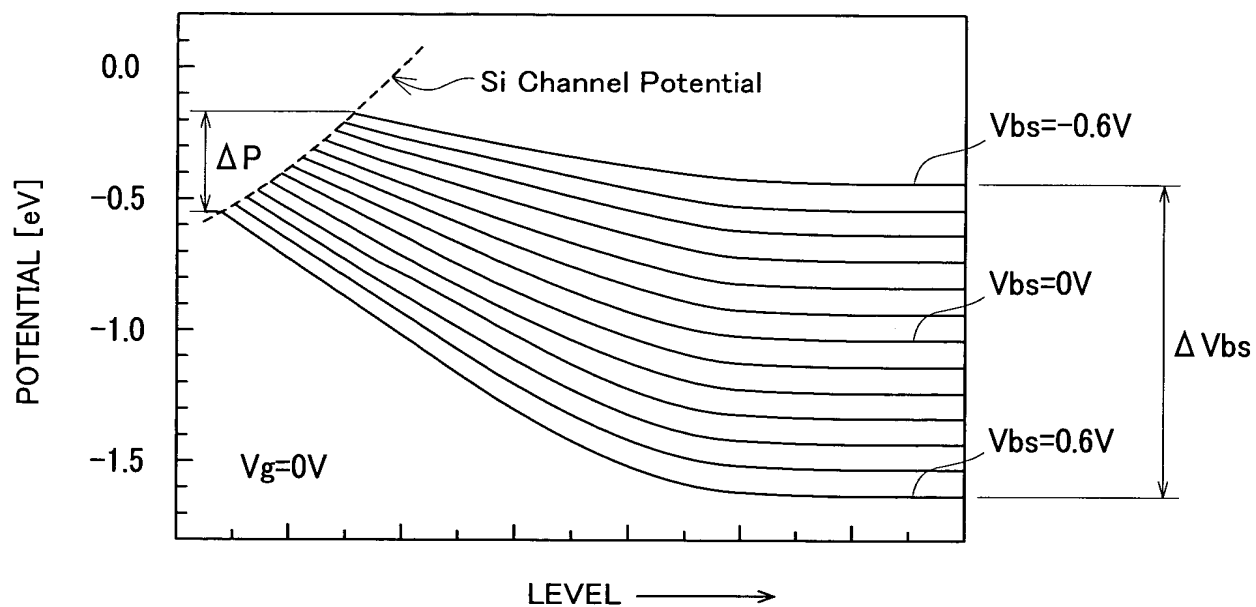


Fig. 3 (a)

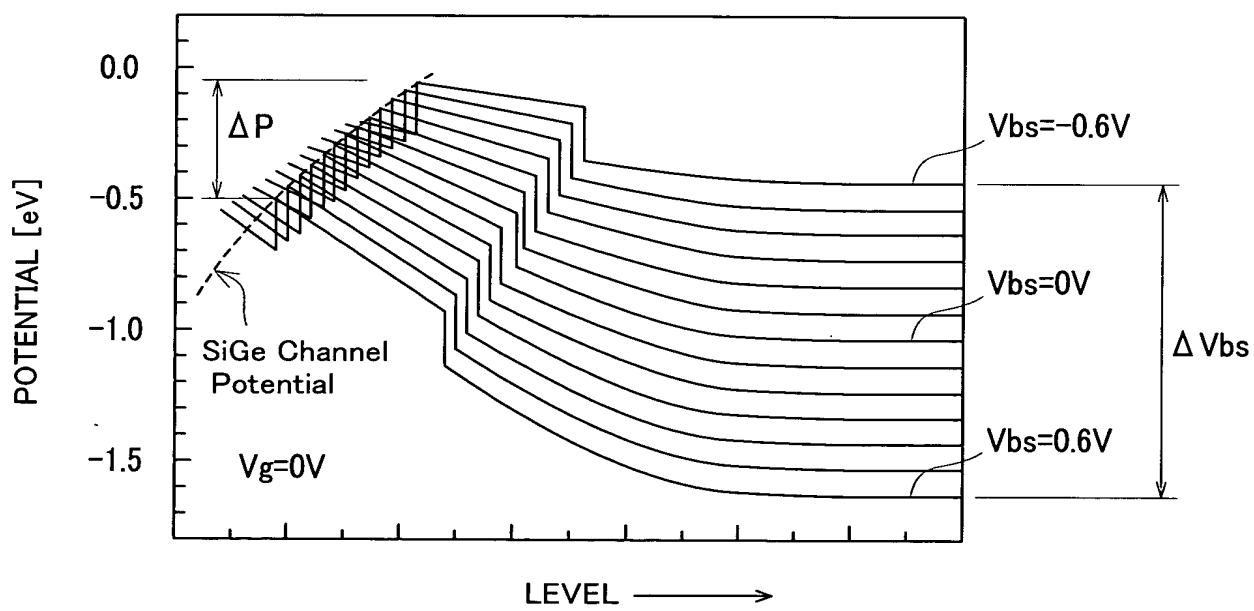


Fig. 3 (b)

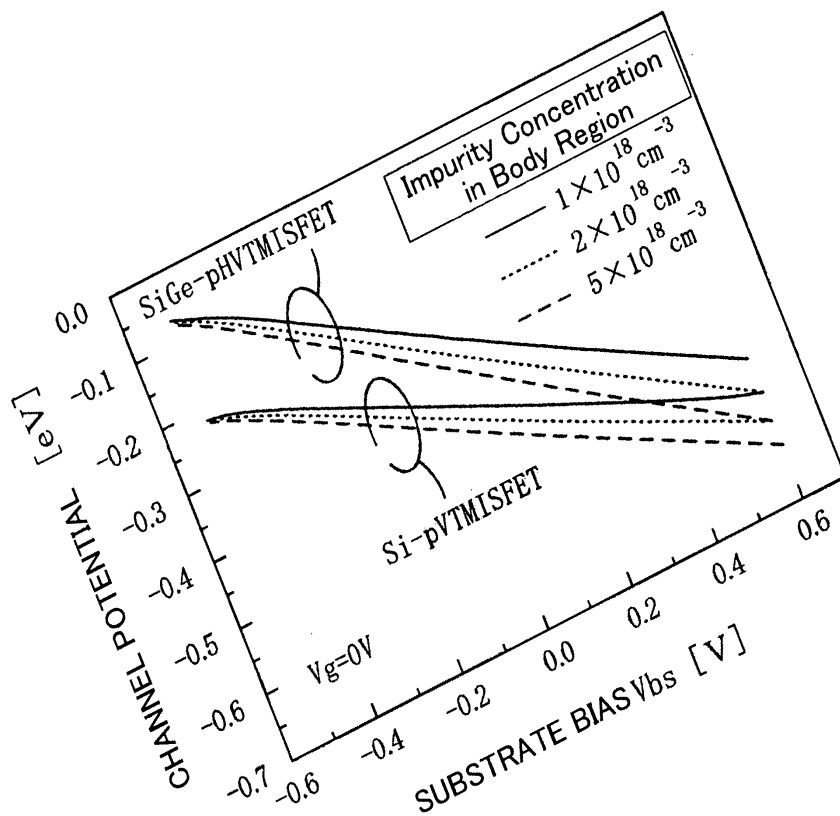


Fig. 4

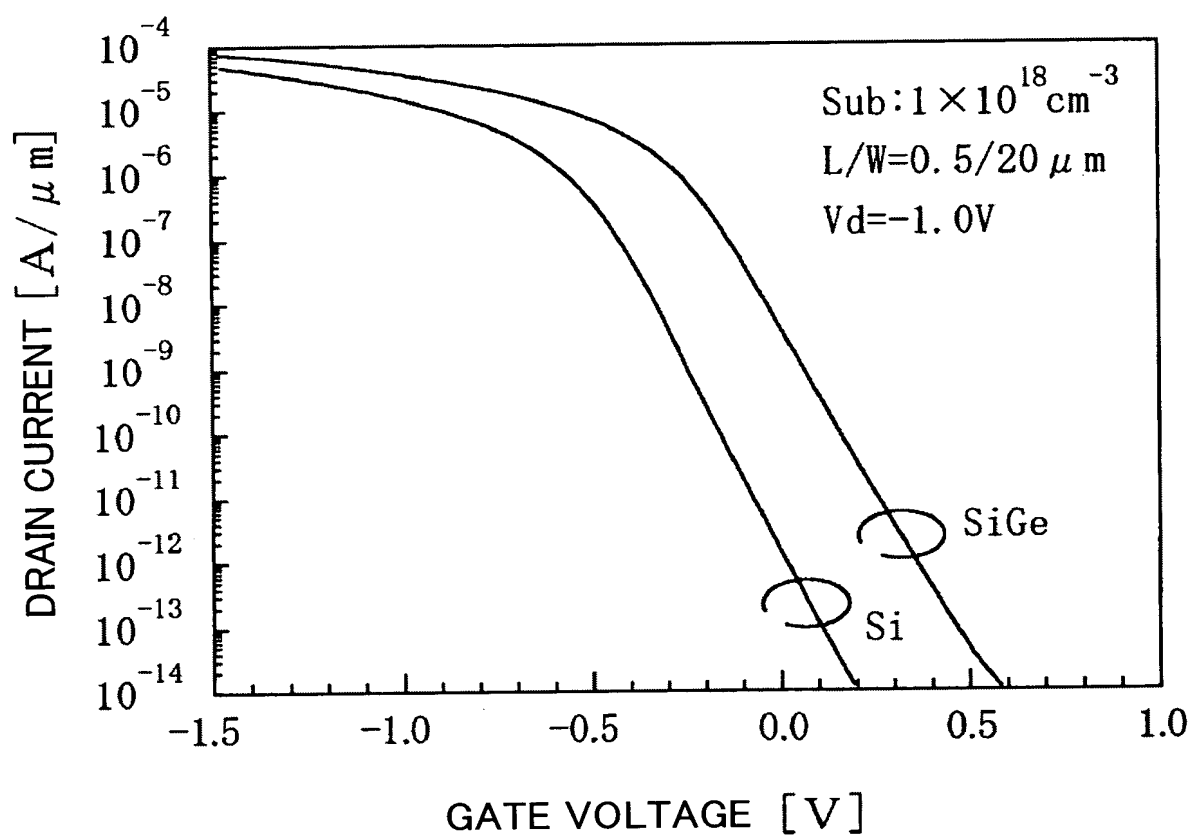


Fig. 5

Fig. 6(a)

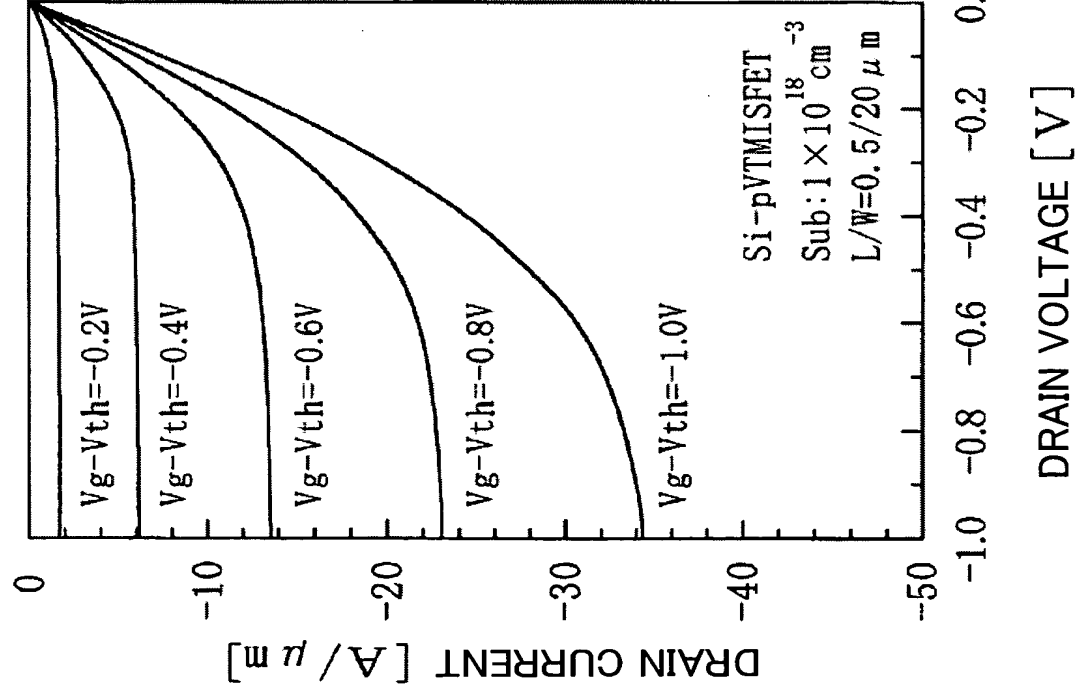
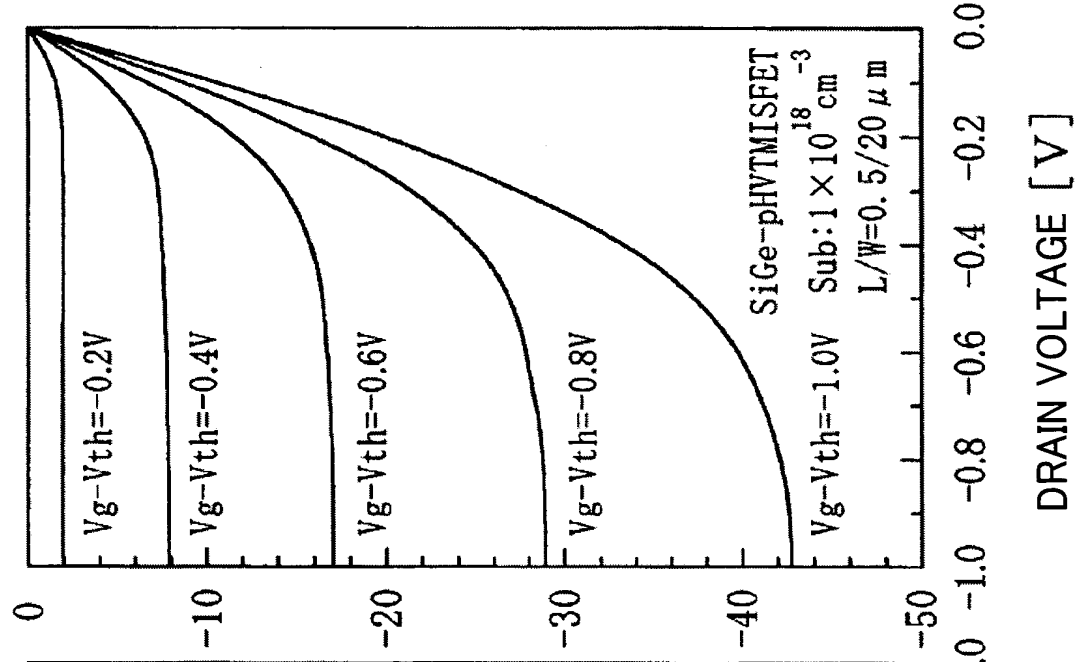


Fig. 6(b)



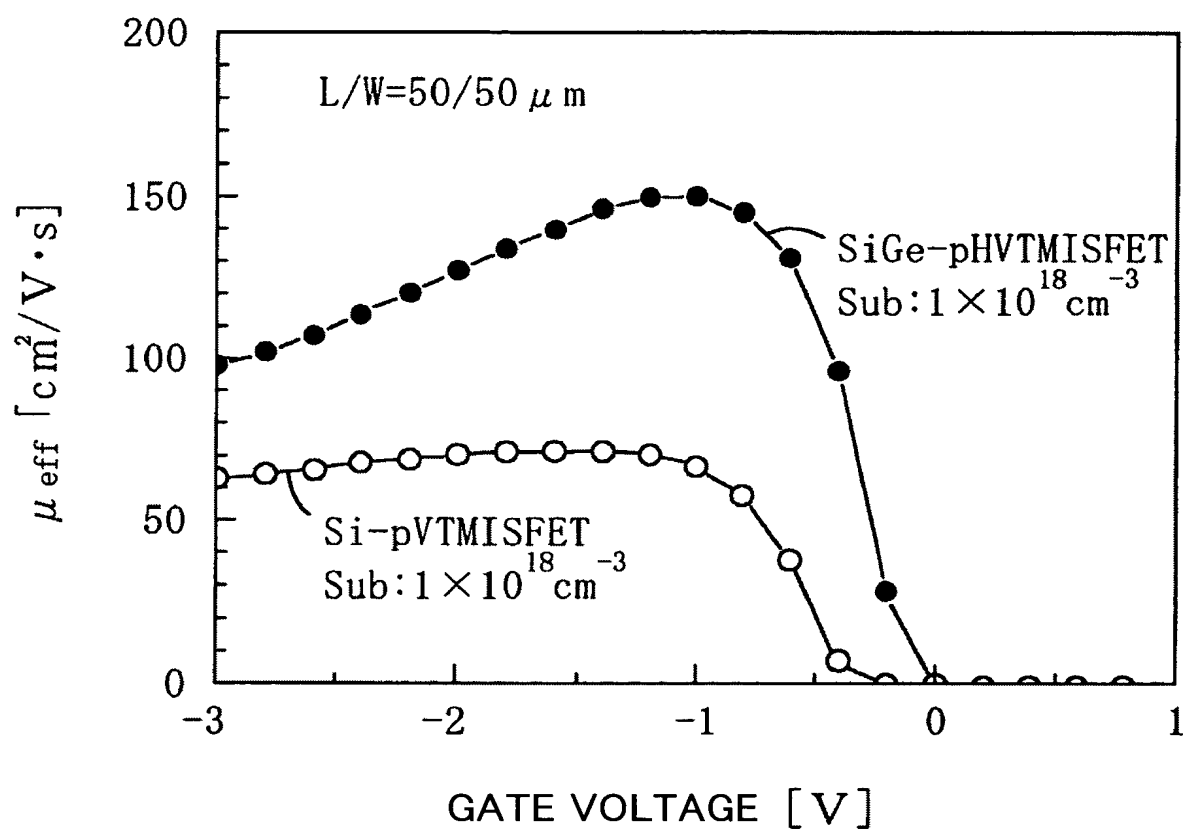


Fig. 7

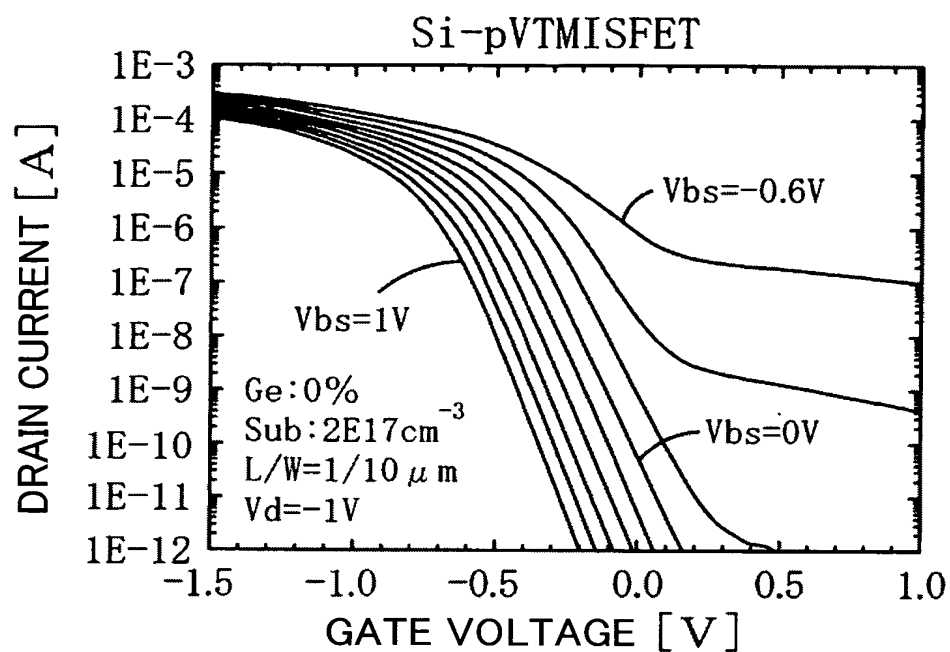


Fig. 8 (a)

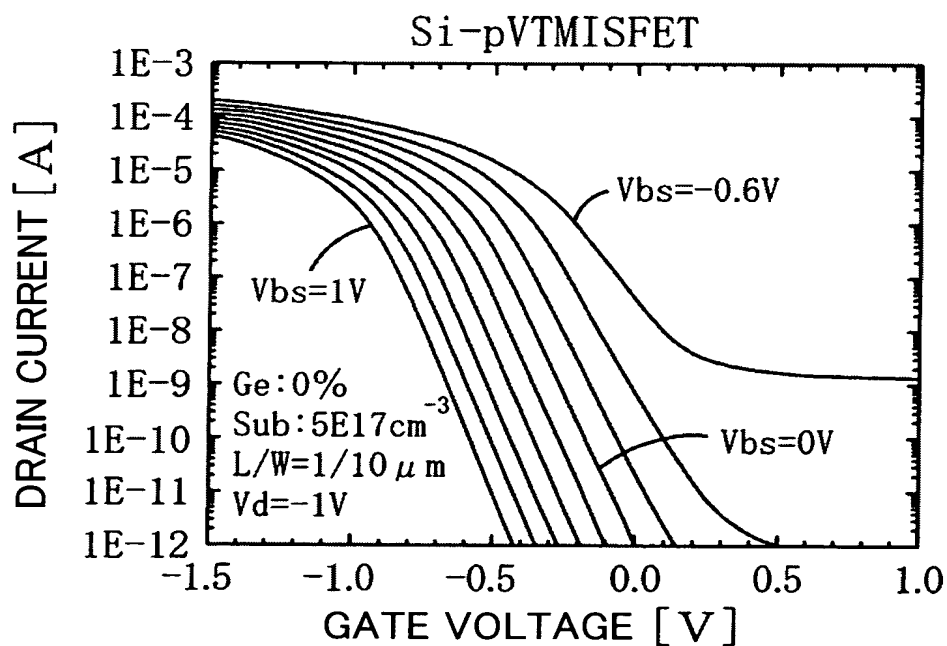
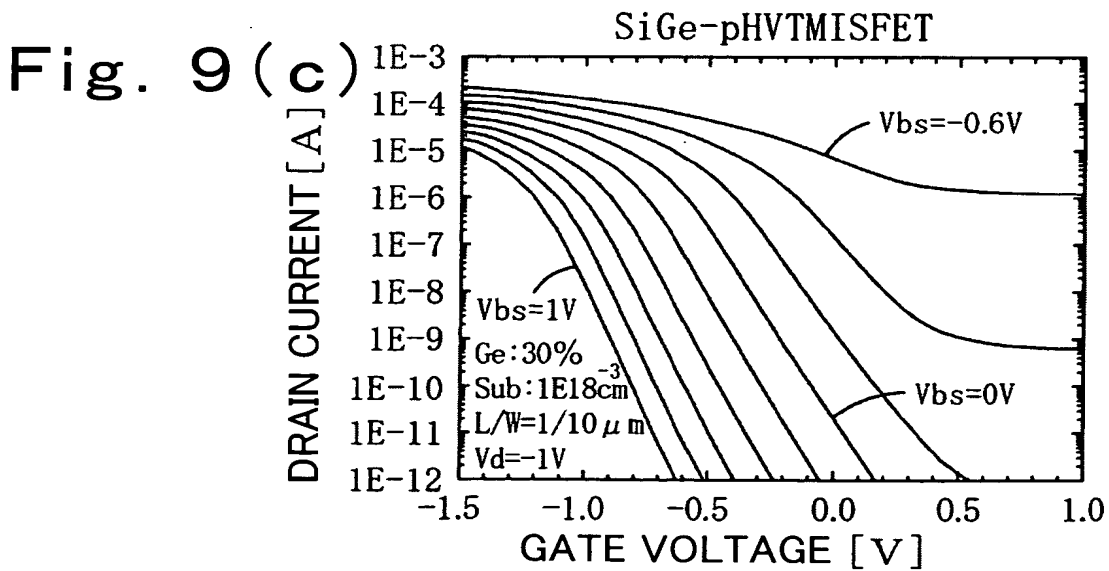
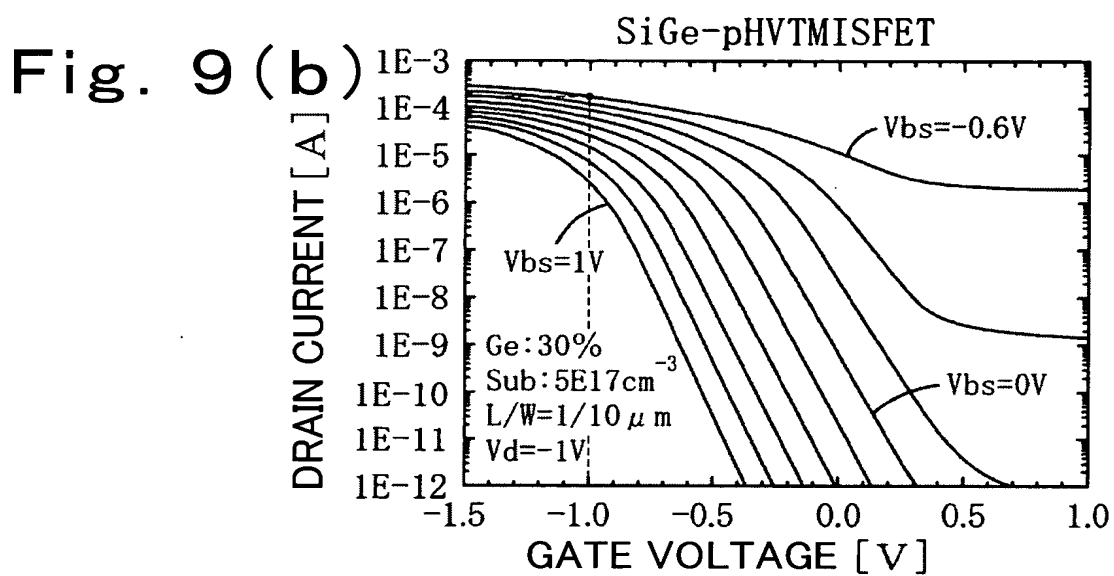
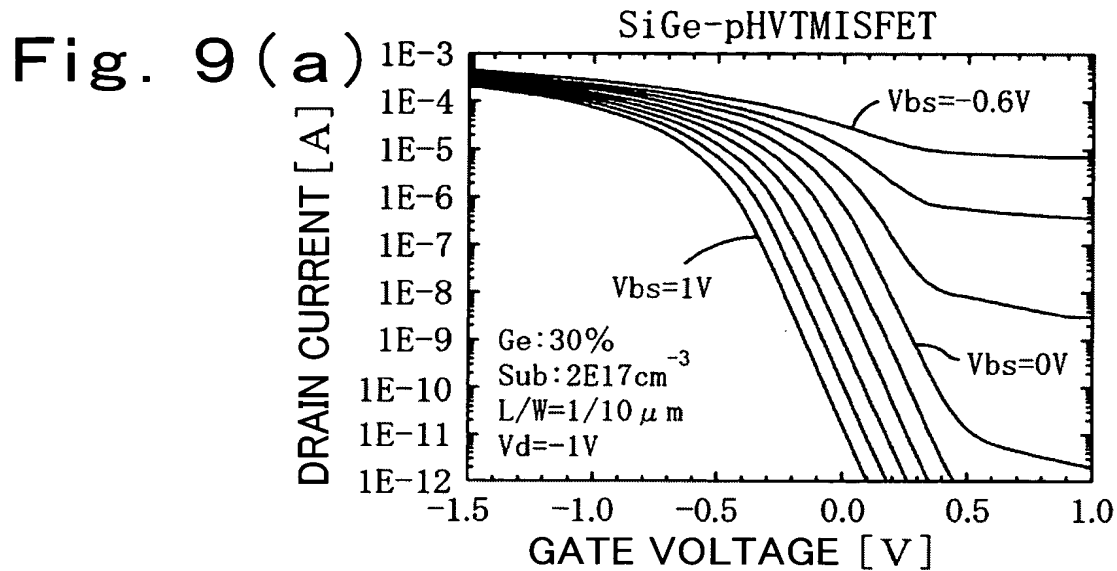


Fig. 8 (b)



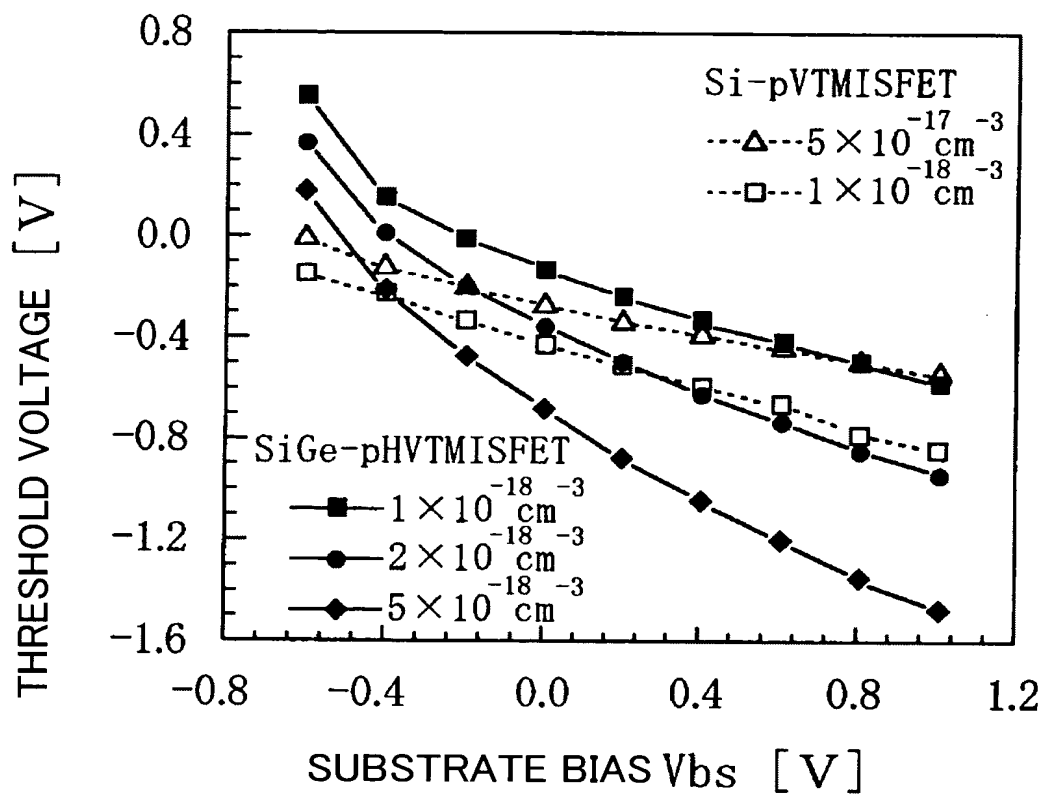


Fig. 10

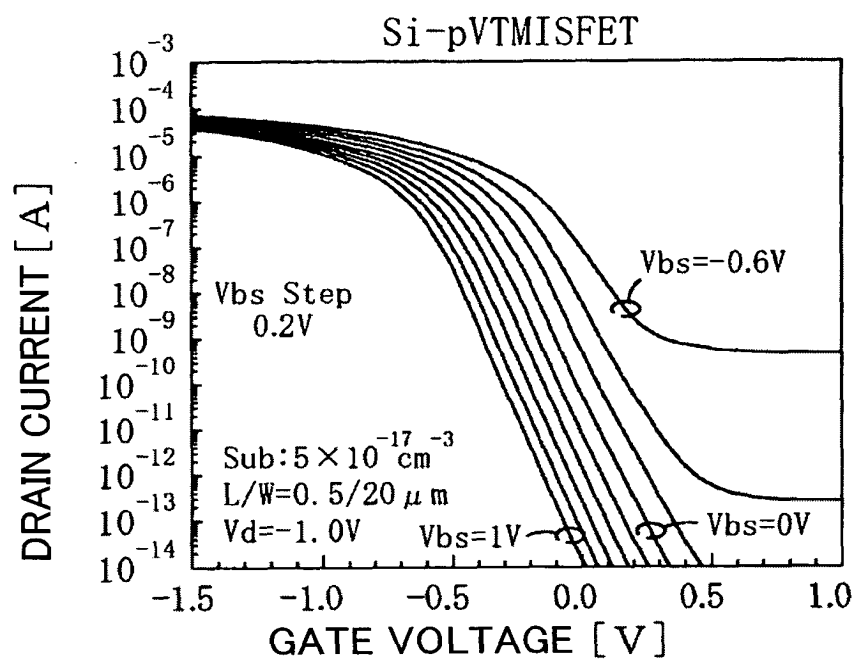


Fig. 11 (a)

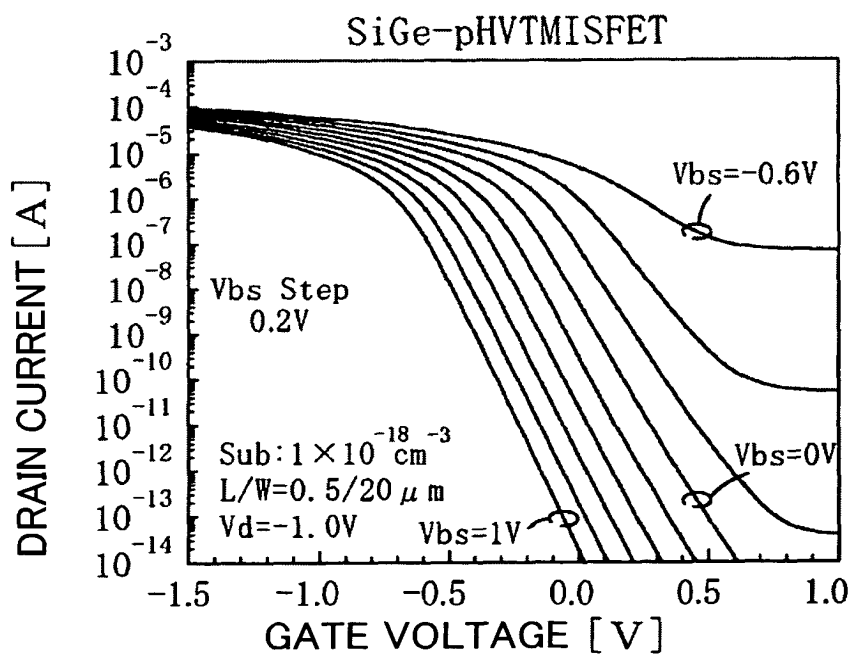


Fig. 11 (b)

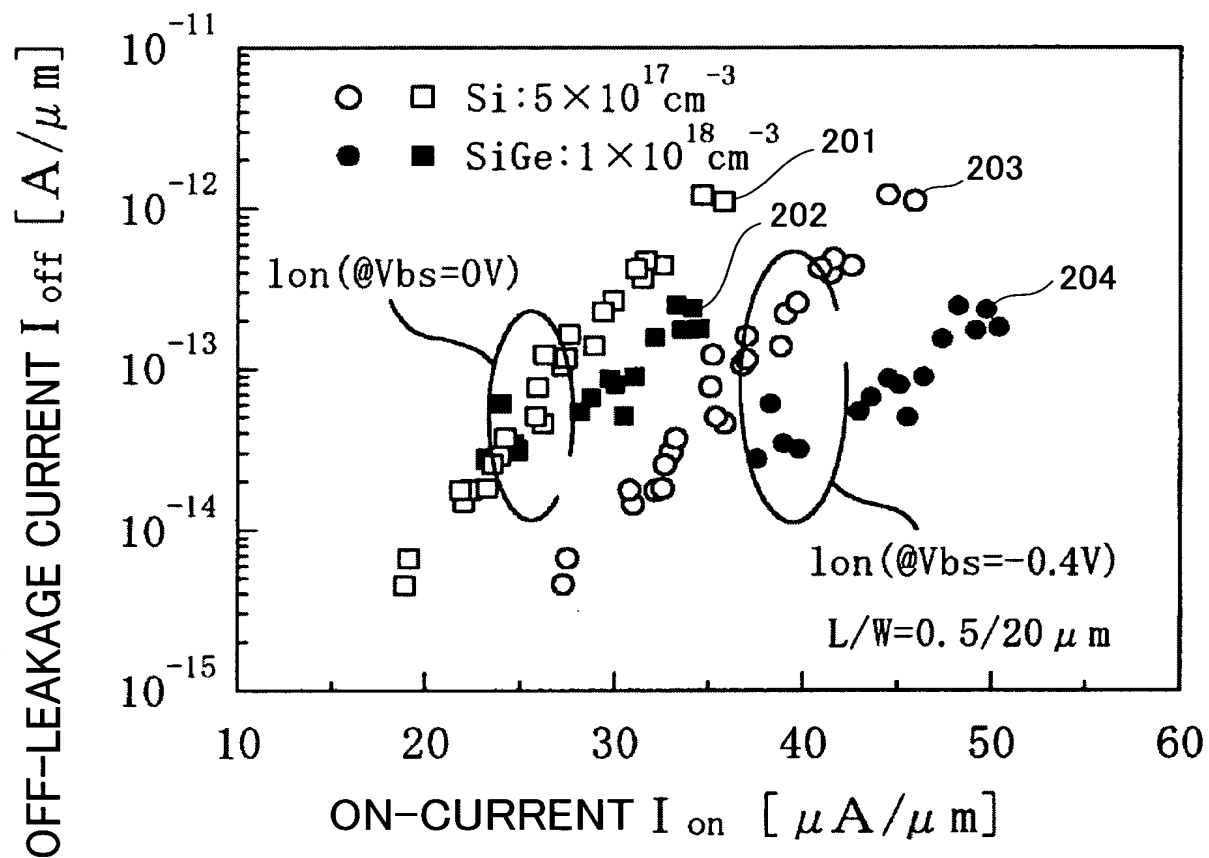


Fig. 12

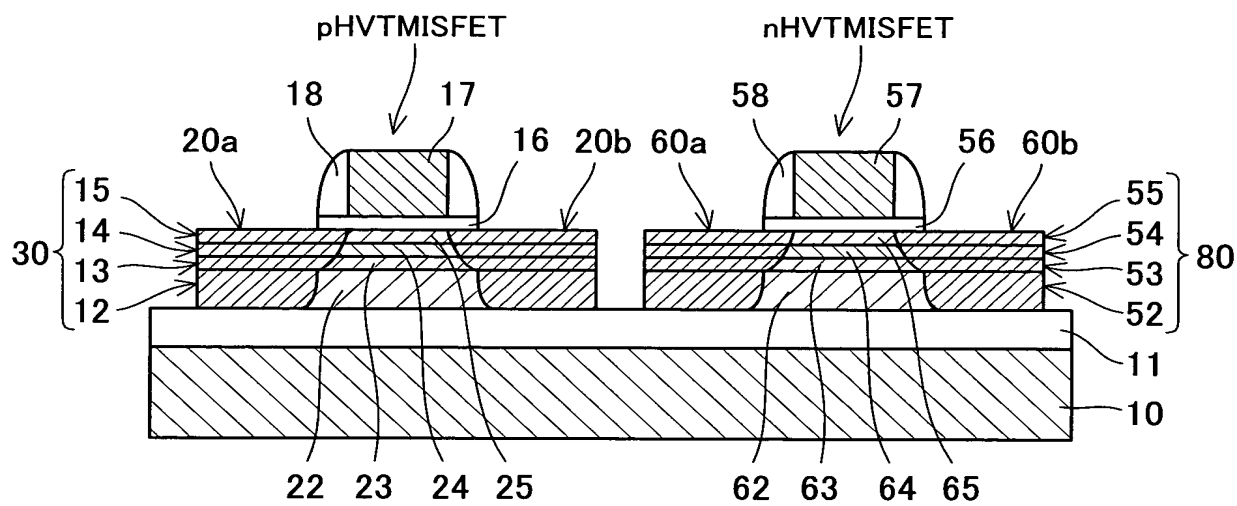


Fig. 13(a)

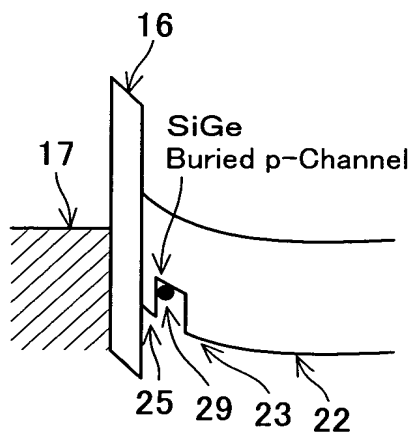


Fig. 13(b)

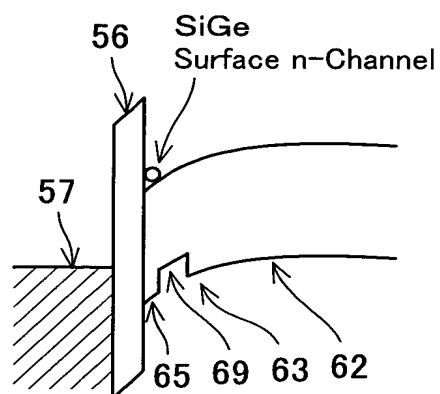
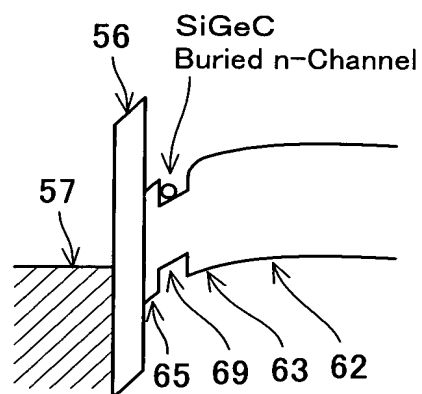
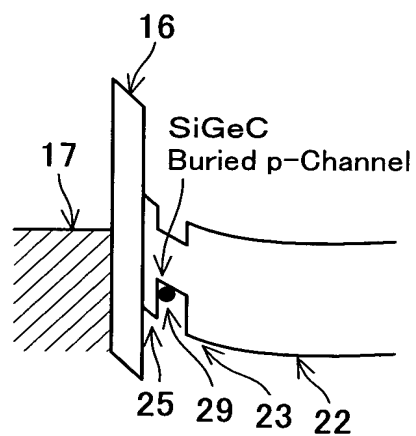
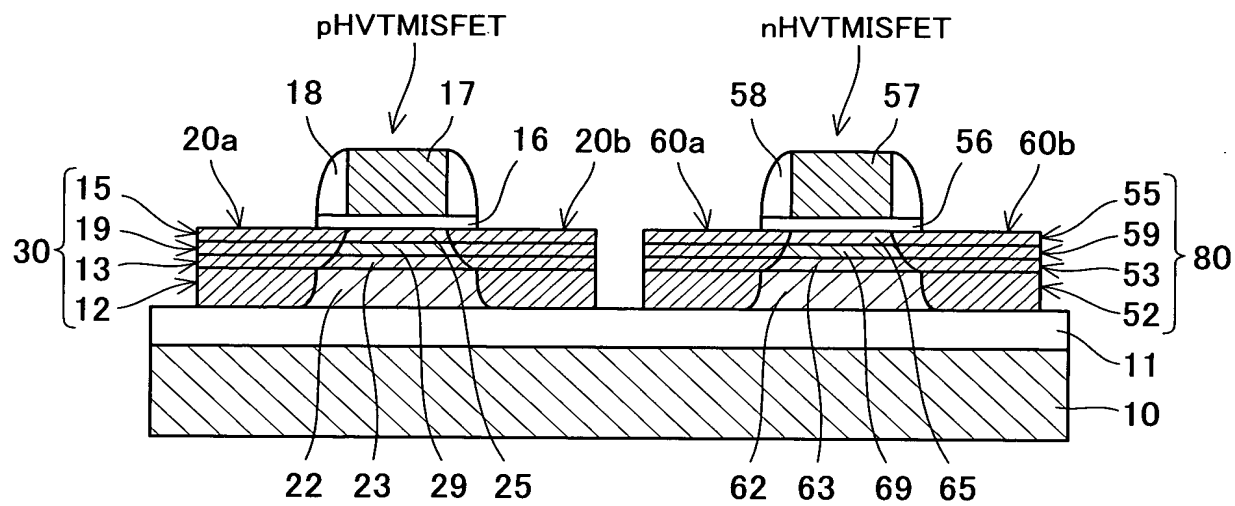


Fig. 13(c)



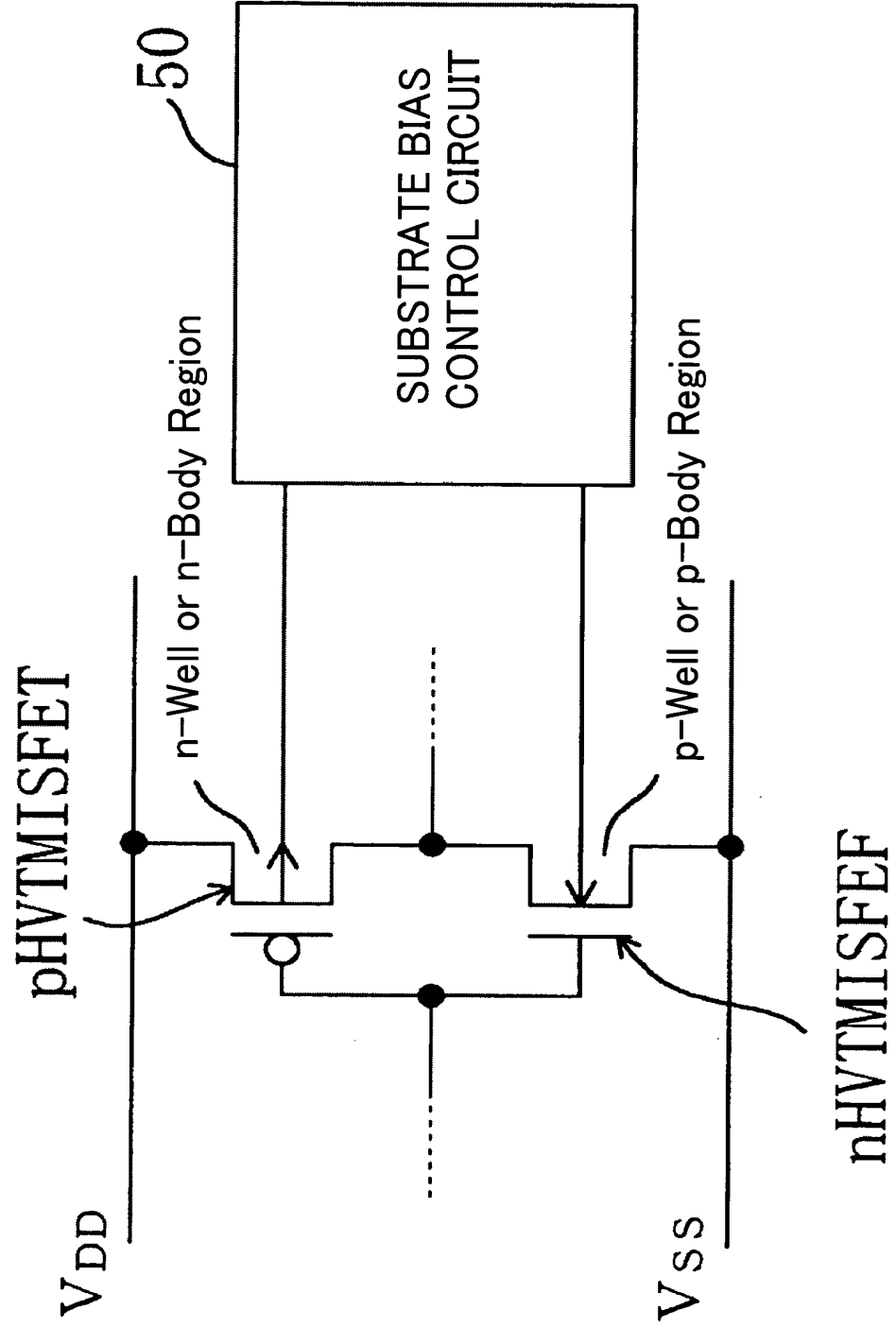


Fig. 15

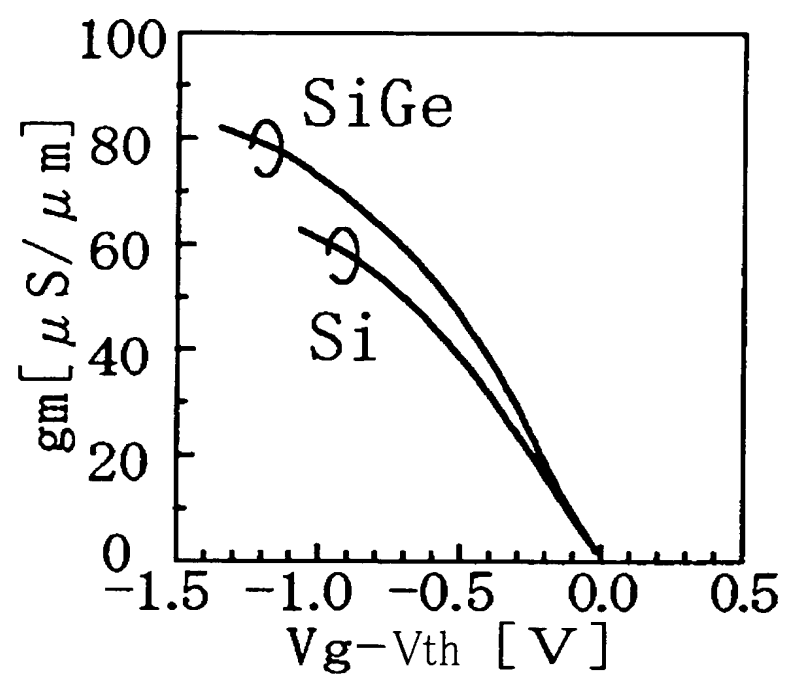


Fig. 16

| | | THRESHOLD VOLTAGE [V] | | | | |
|--|------|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | Si-pVTMISFET | Si-pVTMISFET | SiGe-pHVTMISFET | SiGe-pHVTMISFET | SiGe-pHVTMISFET |
| | | 5E17cm ⁻³ | 1E18cm ⁻³ | 1E18cm ⁻³ | 2E18cm ⁻³ | 5E18cm ⁻³ |
| SUBSTRATE BIAS VOLTAGE [V] | 1 | -0.540 | -0.842 | -0.575 | -0.942 | -1.480 |
| | 0.8 | -0.494 | -0.778 | -0.499 | -0.842 | -1.350 |
| | 0.6 | -0.444 | -0.660 | -0.419 | -0.733 | -1.200 |
| | 0.4 | -0.392 | -0.588 | -0.332 | -0.619 | -1.044 |
| | 0.2 | -0.335 | -0.510 | -0.237 | -0.494 | -0.874 |
| | 0. | -0.273 | -0.427 | -0.132 | -0.355 | -0.685 |
| | -0.2 | -0.202 | -0.334 | -0.008 | -0.195 | -0.470 |
| | -0.4 | -0.120 | -0.228 | 0.154 | 0.010 | -0.212 |
| | -0.6 | -0.009 | -0.148 | 0.559 | 0.376 | 0.177 |
| SUBSTRATE BIAS COEFFICIENT UNDER REVERSE BIAS γ_1 | | -0.298 | -0.403 | -0.500 | -0.660 | -0.898 |
| SUBSTRATE BIAS COEFFICIENT UNDER FORWARD BIAS γ_2 | | -0.383 | -0.498 | -0.715 | -0.913 | -1.183 |
| SUBSTRATE BIAS COEFFICIENT NEAR 0V γ_0 | | -0.333 | -0.440 | -0.573 | -0.748 | -1.010 |
| SUBSTRATE BIAS COEFFICIENT RATIO γ_2/γ_1 | | 1.286 | 1.236 | 1.430 | 1.383 | 1.318 |

$$\gamma_1 : (V_{th}(V_{bs}=0V) - V_{th}(V_{bs}=-0.4V)) / (0 - (-0.4))$$

$$\gamma_2 : (V_{th}(V_{bs}=-0.4V) - V_{th}(V_{bs}=0V)) / (-0.4 - 0)$$

Fig. 17